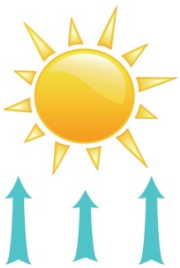
BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday June 20, 2014

An amazing 1–1 ½ inches of rain fell this week across local croplands which actually contributed a bit to soil moisture. Rainfall and cooler temperatures reduced crop water use to under 1 inch last week but warmer temperatures should boost it back to 1 ½ inches next week. With crop water use of about ¾ inches last week and 1-1 ½ inches of rain, soils picked up ¼-½ inch of moisture. Anything added as irrigation went entirely into boosting soil moisture. The last page of this report is a condensed summary of recommendations for the entire season. Work towards these goals for best results and check out our irrigation guide for more details at: http://blackfootchallenge.org/Articles/wp-content/uploads/2013/06/BFIrrigationGuideFinalv3.0.pdf.

WEATHER – REAL RAIN & PERFECT GROWING CONDITIONS

It actually rained this week dumping 1-1 ½ inches on local croplands with up to 2 inches on local mountains. Snow-capped peaks suggested a small increase to the snowpack as well. However, we are still not up to average rainfall for the year or the growing season. A mix of warm weather and scattered clouds are expected next week. The 30 and 90 day forecasts indicate normal temperatures and above normal rainfall.

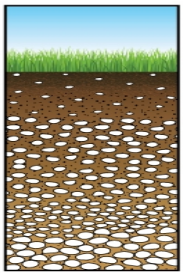


CROP WATER USE – HIGH

Crop water use dipped this last week due to cool temperatures, high humidity and rainfall. Crop water use will increase quickly to high with the return of warmer temperatures. See the table and chart on Page 3 for more details.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**0.8**	**1.4**	(1.2 - 1.6)	7.5
PASTURE	**0.7**	**1.2**	(1.2 -1.5)	6.6
SPRING GRAINS (5-15 planting)	**0.8**	**1.4**	(1.2 - 1.6)	4.0
WINTER WHEAT	**0.8**	**1.4**	(1.2 - 1.6)	8.3
LAWNS	**0.7**	**1.3**	(1.2 -1.6)	7.1

[1]Expected water use (range if weather becomes cooler or hotter than expected)
[2]Beginning May 1 - season start date



SOIL MOISTURE – DROPPING FAST WITH HIGH CROP USE

Don't get too excited, that 1-1 ½ inches of rainfall last week only added ¼-½ inch to soil moisture after you subtract crop water use and evaporation loss. The good news is that any irrigation applied last week was very effective at increasing soil moisture levels. Filling up your soil now while water is available gives you flexibility later.

WEEKLY TIPS

Ready, Set, Grow! - Now Is The Time To Pour On The Water!

Whether you practice careful irrigation scheduling all year, or have a more casual attitude towards irrigation - **now is the time to get the biggest bang for your efforts!** Now is the time to pour on the water in amounts that match the actual crop water use. For the next 4-6 weeks before cutting, alfalfa will use 1 ½ – 2 inches during hot weeks and 1 – 1 ½ inches during cool weeks. This is the time when every dollar spent to irrigate will return many in crop yield.

When Should I Irrigate Next?

Recent rainfall combined with irrigation has left some irrigators with full soil profiles and flexibility about when to irrigate next. Those with pivots and very clayey soils that absorb water slowly will continue to irrigate at low rates to keep soil moisture high. Those with other soil types have more flexibility.

One option (if you have a variable-drive pivot) is to continue to irrigate but at a reduced rate. If your soil is full and you have a variable-drive pivot you can reduce your application rate to match the actual weekly crop water use listed in these weekly reports. This will keep your soil moisture full and

Another option is to pause between irrigations. This gives you time to concentrate on other things. It also allows the soil to warm up, become more oxygenated and increase beneficial biological activity. How long to wait is determined by how much soil moisture you have stored and how much the crop is using. Soil water holding capacity (WHC) is about 1 inch per foot for sandy soils and 2 inches for clayey soils with most local soils about 1.5 – 1.75 inches per foot. Crops take most of their soil moisture from the surface foot. Crop water use ranges from 0.75 – 1.5 inches per week for most of the season. So 1.5 inches stored in the surface foot of soil will last 1-2 weeks. However, production is best when soil moisture is maintained above 50% of the water holding capacity which would have irrigation starting again in ½ to 1 week. This suggests you have a minimum of 3-7 days to turn off. However, you must also consider the time it will take to get over the field. Pivots move quicker than wheel and hand lines.

Grain crops are usually managed for a 2 foot root zone and hay or pasture crops for a 3 foot root zone. So a typical local soil that holds 1.5 inches per foot will hold 4.5 inches in a 3 foot hay crop root zone. This means that if your soil is full and crop water use is 1.5 inches per week you would not need to irrigate again for 3 weeks (dry soil) or 1.5 weeks (50% f WHC). Most irrigators will apply water more frequently but this shows how keeping your soil full gives you a buffer if equipment breaks or other demands require attention.

Another option is simply to observe your soil moisture at the driest part of the field (first irrigated) and irrigate again when the soil dries to about half of its soil water holding capacity. This is when the soil still feels slightly moist and may leave a trace of moisture on your hand but not much. The soil will hold together into a ball but no free water will run off. The soil is too dry if it crumbles easily (sandy and loamy soils) or if it is very hard to crumble or deform (clay soils). A soil probe will easily penetrate a soil at full water holding capacity and can also be used to evaluate the depth of penetration for individual irrigations. When using this method, most irrigators will base their irrigation decisions on the surface foot – trying to keep it moist and considering moisture is deeper soil layers as a bonus.

For further information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

BLACKFOOT 2014 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

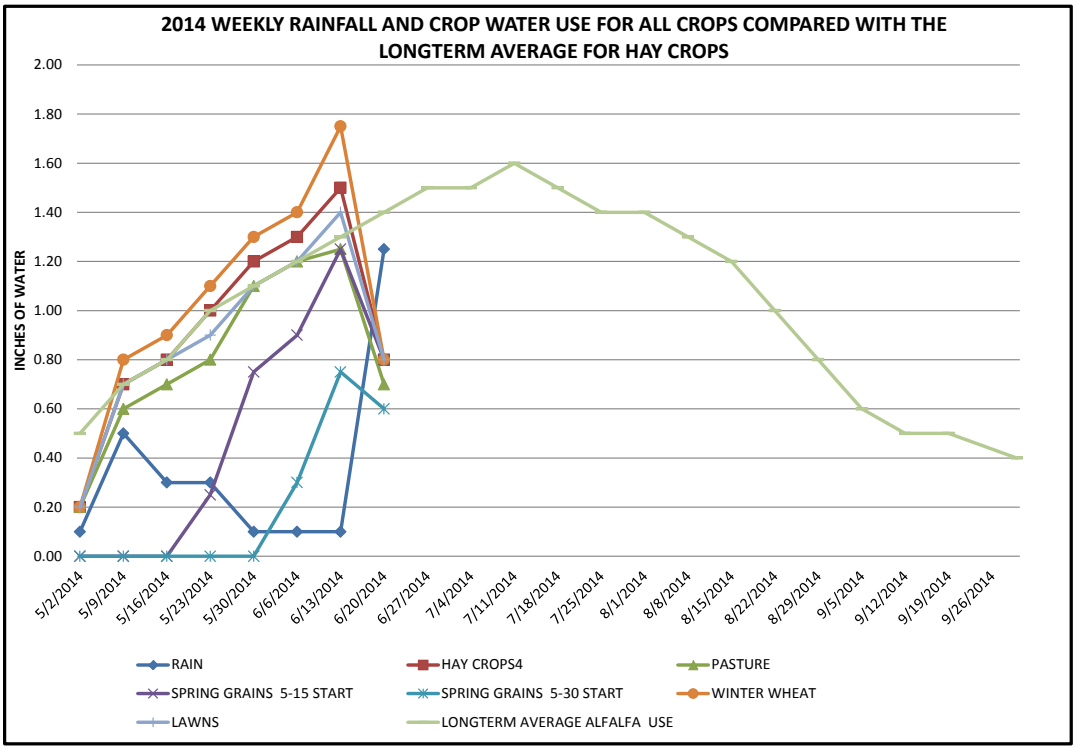
	RAIN[1]	2013 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-15 START	SPRING GRAINS 5-30 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE ALFALFA USE	HOT WEEK ALFALFA HAY WATER USE	COOL WEEK ALFALFA HAY WATER USE
5/2/2014	0.10	0.20	0.20	0.00	0.00	0.20	0.20	0.50	0.80	0.20
5/9/2014	0.50	0.70	0.60	0.00	0.00	0.80	0.70	0.70	0.90	0.30
5/16/2014	0.30	0.80	0.70	0.00	0.00	0.90	0.80	0.80	1.00	0.40
5/23/2014	0.30	1.00	0.80	0.25	0.00	1.10	0.90	1.00	1.10	0.60
5/30/2014	0.10	1.20	1.10	0.75	0.00	1.30	1.10	1.10	1.20	0.80
6/6/2014	0.10	1.30	1.20	0.90	0.30	1.40	1.20	1.20	1.30	0.90
6/13/2014	0.10	1.50	1.25	1.25	0.75	1.75	1.40	1.30	1.50	1.00
6/20/2014	1.25	0.80	0.70	0.80	0.60	0.80	0.80	1.40	1.70	1.10
6/27/2014								1.50	1.90	1.10
7/4/2014								1.50	2.00	1.20
7/11/2014								1.60	2.10	1.30
7/18/2014								1.50	2.00	1.20
7/25/2014								1.40	1.90	1.10
8/1/2014								1.40	2.20	1.10
8/8/2014								1.30	1.70	1.00
8/15/2014								1.20	1.50	0.90
8/22/2014								1.00	1.30	0.70
8/29/2014								0.80	1.00	0.50
9/5/2014								0.60	0.80	0.40
9/12/2014								0.50	0.70	0.30
9/19/2014								0.50	0.70	0.30
9/30/2014								0.40	0.60	0.20
TOTAL	**2.75**	**7.50**	**6.55**	**3.95**	**1.65**	**8.25**	**7.10**	**23.20**	**29.90**	**16.60**

[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-May and Sept, 0.15-June and August, 0.2-July)

[2] Maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free.

[3] Average water use for each crop each week based on historic data.

[4] Hay Crop water use should be reduced by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



THE BLACKFOOT DRAINAGE IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations with more detail provided throughout our irrigation guide.

APRIL – GET READY AND PLAN YOUR IRRIGATION STRATEGY!

- Get your irrigation system ready – perform maintenance and test system.
- Evaluate weather conditions and predictions then plan for drought if needed.

MAY – CHECK SOIL MOISTURE & BE READY FOR UNUSUAL HEAT OR COLD!

- Check the soil moisture content at the start of growing season (May 1) and fill up the soil to its water holding capacity during early irrigations (2-4 inches).
- Watch for dry soil conditions, especially with new plantings and apply water to ensure good germination and emergence.
- Irrigate deeply at least once early in the season to promote deep root growth.
- Apply 2-5 inches of irrigation to hay and pasture crops in May depending on weather. Apply 0-2 inches to spring grains and new plantings as needed based on weather and growth. Apply extra water to fill up the soil (2-4 in).

JUNE – THIS IS THE TIME TO MAKE YOUR BIGGEST EFFORT SO POUR IT ON!

- Apply 6-8 inches of irrigation in June to hay and pasture crops and winter wheat depending on weather. Apply 5-8 inches to spring grains and new plantings as needed based on weather and growth.
- Consider irrigating deeply to fill up soil root zone and promote deep root growth.
- Be sure small grains are irrigated well during their critical periods of boot, bloom and early heading.

JULY – POUR IT ON UNTIL HARVEST AND RETURN QUICKLY

- Apply 1 - 2 ½ inches of irrigation per week in July to all crops - depending on weather.
- Cutting is a critical stress period for hay crops, especially alfalfa so irrigate deeply to fill up the root zone before cutting then get back across the field quickly after cutting. Crop water use declines when hay is cut so this is a good opportunity to fill up the soil again. Irrigate at least once after cutting.
- Stop irrigating small grains at the milk to soft dough stage but be sure there are 1- 2 inches of soil moisture left at this stage to prevent kernels from shrinking.

AUGUST- KEEP IRRIGATING SMALL GRAINS UNTIL KERNELS MATURE, BE DROUGHT AWARE!

- Apply 1 - 2 inches of irrigation per week in August to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed.
- Many folks irrigate for pasture following their one hay cutting. Irrigate according to how much pasture you seek and with consideration for other water needs in the drainage, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time.

SEPTEMBER – APPLY AS NEEDED/AVAILABLE & GET READY FOR SPRING!

- Apply ½ - 1 ½ inches of irrigation per week in September to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed. Prepare the system for winter and an early start next spring.